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THE PLOCHERE COLOR SYSTEM: A DESCRIPTIVE ANALYSIS[1]

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Abstract

The Plochere Color System is a collection of 1248 painted papers, the colors being produced by systematic pigment mixtures. The Munsell book notation of each of the samples is given, and certain regularities and singularities in the system are discussed.

Introduction

The Plochere Color System (8) is a collection of 1248 painted cards, each 3 by 5 in. in size, accompanied by an explanatory book, and intended mainly for the use of decorators. The system has had a brief notice (1) in the "News Letter" of the Inter-Society Color Council, but it is felt that a more detailed analysis will be of interest, partly as a matter of record, and partly to display some of the special features which may be expected in a system of colors arising from pigment mixtures.

For the Plochere System is quite frankly a pigment-mixture system. The accompanying book gives directions for the production of each of the 1248 colors by the mixture of one or more of only nine chromatic pigments with black and white, a feature of great interest to the decorator. The nine basic pigments and the special black are obtainable from the publishers of the system. The colors are classified into 26 blocks of 48 each, each set being intended to represent one hue, beginning with yellow and proceeding through orange, red, purple, blue, and green to a greenish yellow. It is stated that these hues represent the 24 hues of the Ostwald color circle (2) and two additional hues on either side of yellow, which were felt to give an improved gradation.

Each block of 48 colors is divided into six series of eight. Each of these series is intended to be at a certain chroma level, the first being the strongest in color and the sixth the least saturated. In each series the first color has the lowest value, the remaining seven being produced by extending this first color with increasing amounts of white.

The following Table I shows as an example the arrangement of the 48 colors classified as red, R, and numbered 337 to 384. Note that value as usually understood increases as we proceed downwards in this table. "The numbers

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. . . . . show the visual black content . . . . . The small letters give the white content of each color." (8, p. 3). The arrangement is stated to be based on the Ostwald triangle, but the "rectangular arrangement . . . . . seems to afford a more practical plan for displaying the entire scope of tones and shades of each hue." (8, p. 1).

TABLE I

"Chroma levels"

"Value levels"						
	R1a	R2a	R3a	R4a	R5a	R6a
	R1b	R2b	R3b	R4b	R5b	R6b
	R1c	R2c	R3c	R4c	R5c	R6c
	R1d	R2d	R3d	R4d	R5d	R6d
	R1e	R2e	R3e	R4e	R5e	R6e
	R1f	R2f	R3f	R4f	R5f	R6f
	R1g	R2g	R3g	R4g	R5g	R6g
	R1h	R2h	R3h	R4h	R5h	R6h

The system is certainly not intended as a set of standards, but is produced to meet certain practical needs. It is scarcely to be expected (especially in view of the very reasonable cost) that various examples will agree very closely among themselves, though we have no information on this point. For these reasons there was no thought of making spectrophotometric measurements on all the cards, even if personnel had been available to perform the immense labor of computing trichromatic co-ordinates. Such measurements were however made on one series (329 to 336) of very low chroma. The remainder of the cards were compared directly with the chips in the Munsell Book of Color, the trichromatic co-ordinates and reflectance of which are available (3, 5).

Comparison with the Munsell Book of Color

The cards were compared by one observer of normal color vision (the author), under MacBeth daylight, and in very uniform conditions, with the Pocket Edition of the Munsell Book of Color (6). Gray masks were employed. The copy of the Munsell book was purchased by the National Research Council in April 1947, and had been used very little up to the time of these comparisons.

The matching was made easier by the great similarity in the surface texture of the two sets of colors. On the other hand, many of the Plochere colors are much more saturated than any Munsell colors of similar hue, and many of the series go well above Munsell value 8/, the highest in the book. Thus a good deal of extrapolation was necessary, especially in chroma. Where the Plochere colors fell within the limits of the Munsell chips, it is felt that the accuracy of the matches was probably ± 0.5 for hue, ± 0.2 for value, and ± 0.4 for chroma. No attempt was made to smooth the run of the series, or to eliminate the small irregularities which became apparent; but a certain amount of unconscious smoothing was inevitable. One or two actual mistakes were discovered in plotting the results, and it is hoped that few others escaped

notice. Some of the very dark and unsaturated colors were difficult to assign a hue to, and the writer hesitates to estimate a probable error in hue where the value is less than 3/ and the chroma at the same time less than /1.

Results

The Munsell book notations, derived from direct matching (except for the series 329 to 336 inclusive, which is calculated from spectral reflectance curves), are shown in Table II. In this table the first column shows the Plochere reference number, the second the Plochere color notation, and the third the corresponding Munsell color. It was decided that the problem did not justify the conversion of the data to Munsell renotations, but this may be done for any desired color by the usual methods (7, p. 407).

The hue and chroma of the leading colors of each of the 156 series have been plotted in the polar diagram of Fig. 1. The numbered dots represent the leading colors of the 26 blocks. This clearly shows the reduction in chroma

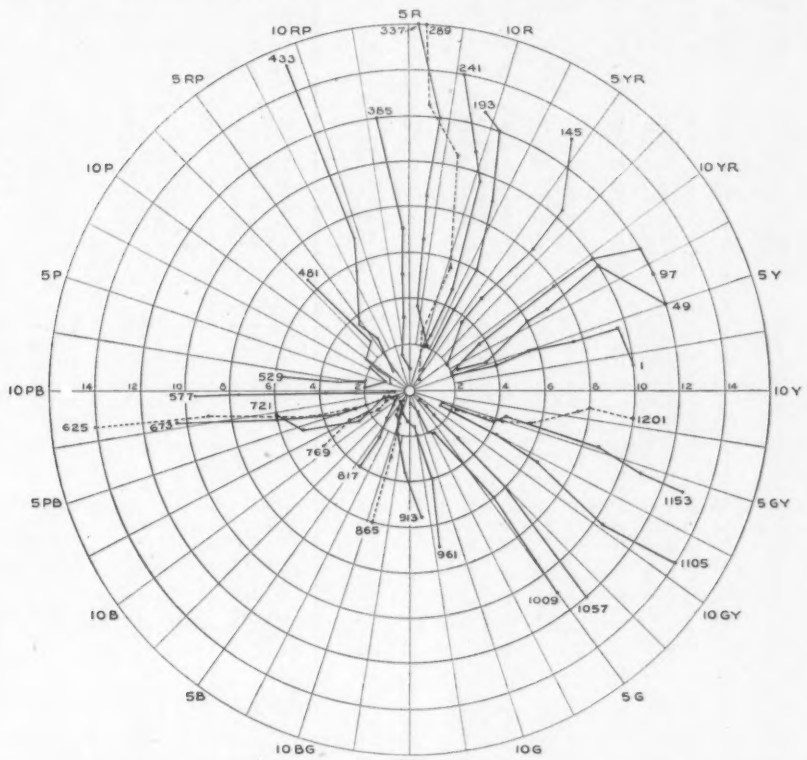

FIG. 1. *Polar diagram showing Munsell hue and chroma of the 156 leading colors in the 26 blocks. The numbers of the colors beginning the leading series of the blocks are given. The occasional use of dashed lines is only for clarity.*

TABLE II

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
1	Y 1–a	8.5Y 9/10	49	Yo 1–a	5Y 9/12
2	Y 1–b	8.5Y 8.5/9	50	Yo 1–b	6Y 9/11
3	Y 1–c	8Y 8.5/8	51	Yo 1–c	6.5Y 9/10
4	Y 1–d	9Y 8.5/7.5	52	Yo 1–d	7.5Y 9/8
5	Y 1–e	9Y 9/6	53	Yo 1–e	7.5Y 9/7
6	Y 1–f	9Y 9/4.5	54	Yo 1–f	7.5Y 9/6
7	Y 1–g	9Y 9/2.5	55	Yo 1–g	8.5Y 9/4
8	Y 1–h	8.5Y 9/1	56	Yo 1–h	? >9/1
9	Y 2–a	5.5Y 8.5/9.5	57	Yo 2–a	1.0Y 7.0/10.0
10	Y 2–b	6.5Y 8.5/8.5	58	Yo 2–b	2.0Y 8.2/10
11	Y 2–c	7Y 9/7.5	59	Yo 2–c	4.0Y 8.4/9
12	Y 2–d	8Y 9/7	60	Yo 2–d	4.5Y 8.5/8
13	Y 2–e	8Y 8.5/6	61	Yo 2–e	5.5Y 9/6
14	Y 2–f	9Y 8.5/5.5	62	Yo 2–f	5.5Y 9/5
15	Y 2–g	10Y 8.5/3.5	63	Yo 2–g	6Y 9/4
16	Y 2–h	10Y 9/1	64	Yo 2–h	? >9/2
17	Y 3–a	5.5Y 6.5/7.5	65	Yo 3–a	2.0Y 5.8/7.0
18	Y 3–b	5.5Y 6.8/7	66	Yo 3–b	2.5Y 5.8/7.5
19	Y 3–c	5.5Y 8/7.5	67	Yo 3–c	3.0Y 7.5/8.0
20	Y 3–d	7Y 8/6.5	68	Yo 3–d	3.5Y 8.3/6.7
21	Y 3–e	7.5Y 8.5/5	69	Yo 3–e	4.0Y 8.5/6.2
22	Y 3–f	8Y 8.5/4	70	Yo 3–f	4.5Y 9/5
23	Y 3–g	8Y 9/2	71	Yo 3–g	5Y 9/4
24	Y 3–h	9Y 9/0.5	72	Yo 3–h	5Y >9/2
25	Y 4–a	5Y 5.8/5.5	73	Yo 4–a	2.0Y 5.6/6.0
26	Y 4–b	5Y 6.5/5.5	74	Yo 4–b	2.5Y 6.2/6.4
27	Y 4–c	5.5Y 7.2/5.5	75	Yo 4–c	3.0Y 7.2/6.2
28	Y 4–d	6Y 8/5.5	76	Yo 4–d	4.0Y 7.8/6.3
29	Y 4–e	7Y 8.5/5.5	77	Yo 4–e	4.0Y 8.3/5.6
30	Y 4–f	7Y 9/5	78	Yo 4–f	4Y 9/5
31	Y 4–g	7.5Y 9/5	79	Yo 4–g	3.5Y 9/3
32	Y 4–h	? >9/?	80	Yo 4–h	? >9/1
33	Y 5–a	5.5Y 4.2/4.0	81	Yo 5–a	4.5Y 3.7/3.6
34	Y 5–b	5.5Y 5.0/4.5	82	Yo 5–b	4.5Y 5.2/3.6
35	Y 5–c	5.5Y 6.2/4.0	83	Yo 5–c	4.0Y 5.8/3.6
36	Y 5–d	5.5Y 7.2/3.8	84	Yo 5–d	4.0Y 7.2/3.2
37	Y 5–e	5.0Y 8.0/3.8	85	Yo 5–e	3.8Y 7.8/3.2
38	Y 5–f	5.5Y 8.5/2.5	86	Yo 5–f	3.5Y 8.2/2.4
39	Y 5–g	6Y 9/2	87	Yo 5–g	3Y 9/2
40	Y 5–h	? >9/?	88	Yo 5–h	? >9/1
41	Y 6–a	4.5Y 3.5/2	89	Yo 6–a	3.5Y 3.8/2.2
42	Y 6–b	3.5Y 4.2/2	90	Yo 6–b	3.2Y 4.2/2.5
43	Y 6–c	3.0Y 5.7/2	91	Yo 6–c	4.0Y 5.3/2.5
44	Y 6–d	3.0Y 6.2/2.5	92	Yo 6–d	4.2Y 6.0/2.5
45	Y 6–e	3.0Y 7.2/2.5	93	Yo 6–e	5Y 7.2/2.7
46	Y 6–f	4.0Y 8.2/2	94	Yo 6–f	5Y 8.3/1.5
47	Y 6–g	5Y 8.8/2	95	Yo 6–g	5Y 9/1
48	Y 6–h	? >9/?	96	Yo 6–h	? >9/1

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
97	OY 1-a	3.0Y 8/12	145	O 1-a	4.0YR 6.5/13
98	OY 1-b	2.5Y 8.2/11	146	O 1-b	7.5YR 7.7/12
99	OY 1-c	3.0Y 8.5/9.5	147	O 1-c	9.0YR 8.2/11
100	OY 1-d	3.5Y 9/9	148	O 1-d	2.0Y 8.7/8.5
101	OY 1-e	4.0Y 9/7	149	O 1-e	3.0Y 9.0/6.6
102	OY 1-f	4.5Y 9/4	150	O 1-f	3.5Y 9/5.3
103	OY 1-g	6Y 9/2	151	O 1-g	4Y 9/4
104	OY 1-h	?7.5Y >9/<1	152	O 1-h	? >9/?
105	OY 2-a	1.5Y 7.6/12	153	O 2-a	6.5YR 6.2/10.5
106	OY 2-b	2.5Y 8.0/12	154	O 2-b	8.0YR 7.0/9.8
107	OY 2-c	2.5Y 8.3/11	155	O 2-c	9.2YR 7.8/9.0
108	OY 2-d	3.2Y 8.5/8	156	O 2-d	1.0Y 8.2/7.6
109	OY 2-e	4Y 8.8/7	157	O 2-e	2.0Y 8.5/6.6
110	OY 2-f	4Y 9/5	158	O 2-f	2.5Y 9/6
111	OY 2-g	5Y >9/4	159	O 2-g	3Y >9/4
112	OY 2-h	? >9/2	160	O 2-h	? >9/3
113	OY 3-a	0.3Y 6.1/9.8	161	O 3-a	6.5YR 5.0/8.2
114	OY 3-b	0.6Y 7.1/9.8	162	O 3-b	6.8YR 5.8/8.4
115	OY 3-c	1.0Y 7.8/9.5	163	O 3-c	7.2YR 6.8/7.8
116	OY 3-d	2.5Y 8.2/8.5	164	O 3-d	8.7YR 7.2/6.5
117	OY 3-e	2.5Y 8.7/7.5	165	O 3-e	9.8YR 7.9/6.4
118	OY 3-f	2.5Y 8.8/6	166	O 3-f	1.2Y 8.4/4.7
119	OY 3-g	3Y 9/4	167	O 3-g	0.5Y 9/3.6
120	OY 3-h	? >9/3	168	O 3-h	? >9/2.5
121	OY 4-a	0.3Y 4.9/7.8	169	O 4-a	6.0YR 4.1/5.0
122	OY 4-b	0.3Y 5.8/7.5	170	O 4-b	7.0YR 5.3/5.6
123	OY 4-c	10.0YR 6.7/8.0	171	O 4-c	6.8YR 5.9/5.8
124	OY 4-d	0.5Y 7.3/6.0	172	O 4-d	8.0YR 7.0/5.8
125	OY 4-e	2.0Y 8.0/5.5	173	O 4-e	8.8YR 8.2/5.6
126	OY 4-f	2.5Y 8.3/5.3	174	O 4-f	9.3YR 8.5/4.5
127	OY 4-g	3Y 8.8/4	175	O 4-g	9.5YR 9/3.6
128	OY 4-h	3Y >9/3	176	O 4-h	?10YR >9/3
129	OY 5-a	1.0Y 3.6/3.6	177	O 5-a	6.0YR 3.3/3.6
130	OY 5-b	10.0YR 5.2/4.0	178	O 5-b	6.2YR 4.8/4.5
131	OY 5-c	0.5Y 5.7/3.6	179	O 5-c	7.5YR 5.3/4.5
132	OY 5-d	1.0Y 6.5/4.2	180	O 5-d	8.0YR 6.6/4.4
133	OY 5-e	1.2Y 7.5/4.4	181	O 5-e	8.3YR 7.2/3.6
134	OY 5-f	1.0Y 8.0/3.6	182	O 5-f	8.3YR 8.0/3.6
135	OY 5-g	1.0Y 8.8/3.6	183	O 5-g	8.0YR 8.7/3.5
136	OY 5-h	1.0Y 9/3	184	O 5-h	?8YR 9/3?
137	OY 6-a	4.5Y 3.3/2.0	185	O 6-a	1.0Y 2.3/2
138	OY 6-b	3.0Y 4.2/2.0	186	O 6-b	1.7Y 3.8/1.8
139	OY 6-c	3.5Y 5.2/2.6	187	O 6-c	8.5YR 4.9/1.8
140	OY 6-d	2.2Y 5.9/2.0	188	O 6-d	8.3YR 5.7/1.6
141	OY 6-e	3.2Y 7.2/2.0	189	O 6-e	8.0YR 6.7/2.0
142	OY 6-f	3.0Y 8.1/2.0	190	O 6-f	6.0YR 7.9/1.6
143	OY 6-g	3Y 8.8/2.0	191	O 6-g	5.0YR 8.8/1.5
144	OY 6-h	3Y 9/2	192	O 6-h	5YR 9/2

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
193	Or 1–a	9.5R 6.0/12.5	241	RO 1–a	8.0R 4.8/14
194	Or 1–b	2.0YR 6.3/11.5	242	RO 1–b	9.5R 5.7/12
195	Or 1–c	3.2YR 6.9/9.6	243	RO 1–c	9.6R 6.2/10.4
196	Or 1–d	4.0YR 8.5/8	244	RO 1–d	1.5YR 6.8/8.5
197	Or 1–e	8.5YR 9/7	245	RO 1–e	2.5YR 7.8/6.0
198	Or 1–f	9YR 9/6	246	RO 1–f	4.5YR 8.5/4.8
199	Or 1–g	0.5Y >9/4	247	RO 1–g	5YR 9/4
200	Or 1–h	9YR >9/2	248	RO 1–h	?5YR >9/2?
201	Or 2–a	0.5YR 5.0/12	249	RO 2–a	9.5R 4.3/10.8
202	Or 2–b	2.0YR 5.8/11	250	RO 2–b	9.7R 5.3/10.3
203	Or 2–c	3.0YR 6.9/9.6	251	RO 2–c	9.7R 6.2/9.8
204	Or 2–d	5.0YR 7.5/8	252	RO 2–d	1.2YR 7.0/8.4
205	Or 2–e	6.5YR 7.8/7	253	RO 2–e	2.8YR 7.5/6.6
206	Or 2–f	8.5YR 8.3/5.5	254	RO 2–f	4.0YR 8.3/5
207	Or 2–g	1Y 9/4	255	RO 2–g	3YR 9/4
208	Or 2–h	?10YR >9/2	256	RO 2–h	? >9/?
209	Or 3–a	2.0YR 4.0/9.0	257	RO 3–a	0.5YR 4.0/9.5
210	Or 3–b	3.5YR 5.2/8.4	258	RO 3–b	1.0YR 4.6/8.0
211	Or 3–c	4.0YR 6.2/7.0	259	RO 3–c	0.8YR 5.4/7.5
212	Or 3–d	5.5YR 6.9/7	260	RO 3–d	1.0YR 6.5/7.2
213	Or 3–e	7YR 7.8/7	261	RO 3–e	2.2YR 6.9/6.0
214	Or 3–f	7.5YR 8/6	262	RO 3–f	3.0YR 8.2/4
215	Or 3–g	9YR 9/5	263	RO 3–g	3YR 8.8/4
216	Or 3–h	?8YR >9/4	264	RO 3–h	?3YR >9/?
217	Or 4–a	3.5YR 3.2/6.0	265	RO 4–a	1.8YR 3.3/4.7
218	Or 4–b	4.5YR 4.8/6.0	266	RO 4–b	2.5YR 4.0/4.8
219	Or 4–c	5.0YR 6.0/5.6	267	RO 4–c	2.2YR 5.1/4.0
220	Or 4–d	5.5YR 6.8/5.4	268	RO 4–d	3.0YR 6.0/4.5
221	Or 4–e	6YR 7.8/5	269	RO 4–e	4.0YR 6.8/4.5
222	Or 4–f	7YR 8/4.5	270	RO 4–f	3.0YR 7.7/4.0
223	Or 4–g	8YR 8.5/4	271	RO 4–g	3YR 8.7/3
224	Or 4–h	8YR 9/3	272	RO 4–h	?3YR >9/2?
225	Or 5–a	3.3YR 2.7/4	273	RO 5–a	1.0YR 2.8/2.4
226	Or 5–b	3.5YR 4.4/3.6	274	RO 5–b	0.5YR 3.7/2.6
227	Or 5–c	4.2YR 5.2/3.4	275	RO 5–c	10.0R 4.8/2.4
228	Or 5–d	4.6YR 5.9/3.5	276	RO 5–d	0.8YR 5.8/2.6
229	Of 5–e	4.5YR 7.0/3.2	277	RO 5–e	1.0YR 6.6/2.4
230	Or 5–f	4.5YR 7.8/3	278	RO 5–f	1YR 7.3/2
231	Or 5–g	5YR 8.7/3	279	RO 5–g	1YR 8.1/2
232	Or 5–h	6YR 9/3	280	RO 5–h	?1YR 9/2
233	Or 6–a	?4YR 2.2/2	281	RO 6–a	1.8YR 2.2/2
234	Or 6–b	?4YR 3/1	282	RO 6–b	4.0YR 3.5/2.0
235	Or 6–c	5YR 5/1	283	RO 6–c	4.4YR 4.9/2.0
236	Or 6–d	6YR 5.8/1	284	RO 6–d	4.0YR 5.7/2.2
237	Or 6–e	?3YR 6.5/1	285	RO 6–e	3.8YR 6.3/2.0
238	Or 6–f	5YR 7.8/1	286	RO 6–f	3.3YR 6.9/2
239	Or 6–g	5YR 8.5/1.5	287	RO 6–g	3.5YR 8.2/2
240	Or 6–h	?4YR >9/1?	288	RO 6–h	3YR 9/2

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color		Plochere number	Plochere code	Munsell color	
289	Ro 1–a	5.8R	4.6/16	337	R 1–a	6.0R	4.2/16
290	Ro 1–b	6.0R	5.3/13.0	338	R 1–b	4.5R	4.9/13
291	Ro 1–c	5.3R	5.6/10.8	339	R 1–c	3.5R	5.2/10.8
292	Ro 1–d	5.5R	6.3/10.0	340	R 1–d	2.5R	5.9/10.5
293	Ro 1–e	6.2R	7.3/9	341	R 1–e	1.5R	6.6/10
294	Ro 1–f	6R	7.7/7.5	342	R 1–f	1.0R	7.3/10
295	Ro 1–g	6R	8.5/6	343	R 1–g	1R	8/10?
296	Ro 1–h	6R	9/3?	344	R 1–h	?10RP	9/9?
297	Ro 2–a	6.8R	4.4/12.5	345	R 2–a	7.0R	3.8/12
298	Ro 2–b	6.3R	5.0/11.3	346	R 2–b	5.4R	4.4/10.5
299	Ro 2–c	5.8R	5.4/10.5	347	R 2–c	4.2R	5.2/9.5
300	Ro 2–d	5.8R	6.2/9.3	348	R 2–d	3.2R	6.0/10.0
301	Ro 2–e	5.8R	7.3/8.5	349	R 2–e	3.8R	6.7/9.2
302	Ro 2–f	6.3R	8.2/7	350	R 2–f	3.0R	7.5/8
303	Ro 2–g	6.5R	8.8/6	351	R 2–g	2R	8/7
304	Ro 2–h	6.5R	>9/5?	352	R 2–h	2R	9/6?
305	Ro 3–a	8.5R	3.5/10.5	353	R 3–a	6.8R	3.3/8.5
306	Ro 3–b	9.0R	4.3/9.0	354	R 3–b	6.0R	4.2/7.3
307	Ro 3–c	8.0R	5.2/7.6	355	R 3–c	6.0R	5.1/6.6
308	Ro 3–d	7.8R	6.2/7.6	356	R 3–d	4.5R	5.8/8.0
309	Ro 3–e	7.5R	7.0/6.6	357	R 3–e	4.5R	6.8/8.0
310	Ro 3–f	7.8R	7.7/7.0	358	R 3–f	4.0R	7.7/7.5
311	Ro 3–g	7.2R	8.2/5	359	R 3–g	4R	8.5/6
312	Ro 3–h	7R	8.7/4	360	R 3–h	3R	9/4
313	Ro 4–a	0.3YR	3.0/5.6	361	R 4–a	7.0R	3.2/6.6
314	Ro 4–b	1.0YR	3.7/5.5	362	R 4–b	6.2R	4.0/6.0
315	Ro 4–c	9.5R	5.0/4.7	363	R 4–c	5.5R	4.9/5.3
316	Ro 4–d	9.5R	5.8/4.4	364	R 4–d	4.5R	5.8/6.0
317	Ro 4–e	10.0R	6.8/4.4	365	R 4–e	4.5R	6.4/6.6
318	Ro 4–f	9.5R	7.6/4	366	R 4–f	3.0R	7.5/5.5
319	Ro 4–g	9R	8.5/3	367	R 4–g	3R	8.2/4
320	Ro 4–h	9R	9/3?	368	R 4–h	3R	9/3
321	Ro 5–a	9.0R	2.2/2.6	369	R 5–a	7R	2.4/3.6
322	Ro 5–b	9.0R	3.7/2.6	370	R 5–b	6.8R	3.6/3.6
323	Ro 5–c	8.8R	4.9/2.6	371	R 5–c	5.5R	4.9/4.0
324	Ro 5–d	8.3R	5.8/2.4	372	R 5–d	4.0R	5.7/4.8
325	Ro 5–e	7.5R	6.8/2.4	373	R 5–e	3.5R	6.7/5.3
326	Ro 5–f	7.5R	7.7/2.5	374	R 5–f	4.0R	7.6/5
327	Ro 5–g	7.5R	8.7/2	375	R 5–g	4R	8.2/4
328	Ro 5–h	?7.5R	9/2	376	R 5–h	4R	9/4
329	Ro 6–a	?7YR	2.4/0.5	377	R 6–a	1YR	2.3/2
330	Ro 6–b	5YR	3.6/0.6	378	R 6–b	8R	3.2/1.5
331	Ro 6–c	8YR	4.7/0.8	379	R 6–c	7.5R	4.8/1.5
332	Ro 6–d	10YR	5.3/1.0	380	R 6–d	6.8R	5.8/1.5
333	Ro 6–e	5Y	6.7/1.2	381	R 6–e	7R	6.5/2
334	Ro 6–f	10YR	7.6/0.7	382	R 6–f	6R	7.5/2
335	Ro 6–g	7YR	8.2/0.6	383	R 6–g	6R	8.2/2
336	Ro 6–h	5YR	8.6/0.6	384	R 6–h	6R	9/2

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color		Plochere number	Plochere code	Munsell color	
385	Rp 1–a	3R	3.2/12	433	Pr 1–a	9.0RP	3.2/15?
386	Rp 1–b	1.0R	4.2/12	434	Pr 1–b	7.5RP	3.9/13?
387	Rp 1–c	8.5RP	4.8/12	435	Pr 1–c	5.8RP	4.7/13
388	Rp 1–d	8.0RP	5.5/11.5	436	Pr 1–d	3.5RP	5.2/12
389	Rp 1–e	8.0RP	6.5/11	437	Pr 1–e	2.5RP	6.2/12
390	Rp 1–f	7RP	7.5/11	438	Pr 1–f	?3RP	7/12?
391	Rp 1–g	7RP	8.6/10?	439	Pr 1–g	?4RP	8/10?
392	Rp 1–h	7.5RP	9/8?	440	Pr 1–h	?5RP	9/8?
393	Rp 2–a	4.6R	3.1/7.0	441	Pr 2–a	9.5RP	3.0/7.0
394	Rp 2–b	1.5R	4.1/6.8	442	Pr 2–b	4.5RP	3.8/10.0
395	Rp 2–c	9.0RP	4.8/7.5	443	Pr 2–c	3.3RP	4.3/12
396	Rp 2–d	8.2RP	5.7/9.0	444	Pr 2–d	2.5RP	5.4/12
397	Rp 2–e	7.5RP	6.4/9.5	445	Pr 2–e	?3RP	6.3/12?
398	Rp 2–f	8RP	7/9	446	Pr 2–f	3RP	6.7/11
399	Rp 2–g	8RP	8/8	447	Pr 2–g	3RP	8/10
400	Rp 2–h	9RP	9/7	448	Pr 2–h	?3RP	9/8?
401	Rp 3–a	4R	2.8/5.0	449	Pr 3–a	8.5RP	2.3/5.6
402	Rp 3–b	0.5R	3.9/5.3	450	Pr 3–b	4.3RP	3.7/6.6
403	Rp 3–c	8.8RP	4.8/6.0	451	Pr 3–c	3.0RP	4.5/7.5
404	Rp 3–d	8.0RP	5.6/7.5	452	Pr 3–d	2.5RP	5.2/8.0
405	Rp 3–e	7.5RP	6.2/8.5	453	Pr 3–e	2.5RP	6.0/9
406	Rp 3–f	8RP	7.2/8	454	Pr 3–f	?4RP	6.8/9
407	Rp 3–g	9RP	8/8	455	Pr 3–g	4RP	7.8/8
408	Rp 3–h	9RP	9/7?	456	Pr 3–h	5RP	9/8
409	Rp 4–a	4R	2.2/3.3	457	Pr 4–a	4.0RP	2.3/3.5
410	Rp 4–b	1.0R	4.0/4.6	458	Pr 4–b	4.5RP	3.5/4.5
411	Rp 4–c	0.5R	5.0/4.4	459	Pr 4–c	3.5RP	4.6/5.5
412	Rp 4–d	8.3RP	5.7/5.6	460	Pr 4–d	3.0RP	5.1/6.0
413	Rp 4–e	9.0RP	6.4/5.3	461	Pr 4–e	3.5RP	5.8/5.6
414	Rp 4–f	9.0RP	7.1/6	462	Pr 4–f	3.2RP	7.0/6
415	Rp 4–g	9.6RP	8/5	463	Pr 4–g	3RP	7.8/6
416	Rp 4–h	10RP	9/5	464	Pr 4–h	4RP	9/5?
417	Rp 5–a	2.0R	1.8/1.5	465	Pr 5–a	6RP	2.8/2.7
418	Rp 5–b	8.5RP	3.5/2.5	466	Pr 5–b	3.5RP	3.9/3.3
419	Rp 5–c	8.0RP	4.3/3.3	467	Pr 5–c	3.5RP	5.0/4.0
420	Rp 5–d	8.0RP	5.3/4.0	468	Pr 5–d	3.0RP	5.8/4.5
421	Rp 5–e	9.2RP	6.3/4.5	469	Pr 5–e	4.0RP	6.4/4.5
422	Rp 5–f	8.8RP	7.1/4.7	470	Pr 5–f	3.5RP	7.2/4
423	Rp 5–g	9RP	7.8/5	471	Pr 5–g	3.0RP	7.9/4
424	Rp 5–h	10RP	9/5	472	Pr 5–h	3RP	8.5/4
425	Rp 6–a	6R	1.5/0.7	473	Pr 6–a	4.5RP	2.5/1.0?
426	Rp 6–b	2R	3.8/0.5	474	Pr 6–b	?1.0RP	3.3/1.0
427	Rp 6–c	6RP	4.3/1.0	475	Pr 6–c	1.8RP	4.5/2.0
428	Rp 6–d	3.5RP	5.3/1.3	476	Pr 6–d	0.5RP	5.3/2.5
429	Rp 6–e	3.5RP	6.5/1.3	477	Pr 6–e	10.0P	6.5/3.0
430	Rp 6–f	2.5RP	7.1/1.5	478	Pr 6–f	1.0RP	7.1/3.0
431	Rp 6–g	3.5RP	7.8/1	479	Pr 6–g	2.0RP	7.8/3.5
432	Rp 6–h	5RP	9/1	480	Pr 6–h	2RP	9/3

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
481	P 1–a	3.0RP 2.5/6.6	529	Pb 1–a	1.5P 2.5/5.6
482	P 1–b	2.5RP 3.8/9.4	530	Pb 1–b	3.8P 3.9/7.0
483	P 1–c	0.5RP 4.6/10.0	531	Pb 1–c	5.0P 4.8/8.5
484	P 1–d	1.0RP 5.6/9.6	532	Pb 1–d	5.0P 5.8/8.5
485	P 1–e	1.2RP 6.5/10	533	Pb 1–e	6P 6.9/8
486	P 1–f	1.5RP 7.7/9	534	Pb 1–f	7P 7.8/6
487	P 1–g	3.5RP 8.8/8	535	Pb 1–g	8P 9/5?
488	P 1–h	2.5RP 9/4	536	Pb 1–h	? >9/2?
489	P 2–a	4.5RP 2.4/2.6	537	Pb 2–a	2.0P 2.4/3.3
490	P 2–b	2.0RP 3.2/7.0	538	Pb 2–b	4.3P 3.6/8.0
491	P 2–c	2.0RP 4.2/7.2	539	Pb 2–c	5.0P 4.7/8.6
492	P 2–d	1.0RP 5.3/6.7	540	Pb 2–d	5.4P 5.6/8.0
493	P 2–e	2.0RP 6.0/6.4	541	Pb 2–e	6.3P 6.8/7.5
494	P 2–f	1.5RP 6.7/7.2	542	Pb 2–f	7P 7.3/6
495	P 2–g	3.0RP 8.4/8	543	Pb 2–g	8P 8.2/6
496	P 2–h	4RP 8.8/7	544	Pb 2–h	?9P 9/4
497	P 3–a	9P 2.4/2.4	545	Pb 3–a	3.0P 2.4/2.0
498	P 3–b	1.0RP 3.5/5.6	546	Pb 3–b	4.5P 3.6/6.0
499	P 3–c	1.0RP 4.7/5.8	547	Pb 3–c	5.0P 4.9/7.0
500	P 3–d	0.8RP 5.7/7.2	548	Pb 3–d	5.5P 6.3/6.4
501	P 3–e	2.0RP 6.5/5.4	549	Pb 3–e	6.3P 6.8/5.6
502	P 3–f	1.7RP 7.2/5.7	550	Pb 3–f	7P 7.7/5
503	P 3–g	2.0RP 7.8/6	551	Pb 3–g	8P 8.2/5
504	P 3–h	2.5RP 8.5/6	552	Pb 3–h	?8P 9/4
505	P 4–a	10P 2/1.5	553	Pb 4–a	1P 2.2/2.0
506	P 4–b	2.0RP 3.7/2.0	554	Pb 4–b	3.2P 3.5/3.5
507	P 4–c	0.7RP 4.2/4.0	555	Pb 4–c	4.5P 4.6/5.3
508	P 4–d	0.7RP 5.3/4.4	556	Pb 4–d	5.3P 5.7/5.3
509	P 4–e	1.2RP 6.2/4.0	557	Pb 4–e	6.0P 6.3/5.0
510	P 4–f	1.5RP 6.8/4.4	558	Pb 4–f	7P 7.6/4.7
511	P 4–g	1.8RP 8.2/4.7	559	Pb 4–g	8P 8.5/4
512	P 4–h	2.5RP 9/4	560	Pb 4–h	8P 9/2?
513	P 5–a	9.5P 2.0/1	561	Pb 5–a	3.5P 2.6/0.8
514	P 5–b	0.5RP 3.0/2.0	562	Pb 5–b	6.0P 3.3/2.6
515	P 5–c	0.7RP 4.1/3.8	563	Pb 5–c	6.3P 4.5/3.6
516	P 5–d	9.8P 4.9/3.6	564	Pb 5–d	7.0P 5.2/3.6
517	P 5–e	0.5RP 6.1/3.6	565	Pb 5–e	7.5P 6.1/3.5
518	P 5–f	0.5RP 6.9/3.6	566	Pb 5–f	7.0P 7.0/3.6
519	P 5–g	1.5RP 7.8/3.6	567	Pb 5–g	7P 7.8/4
520	P 5–h	2.0RP 9/4	568	Pb 5–h	?7P 8.7/4?
521	P 6–a	5P 2.2/1	569	Pb 6–a	8P 1.8/2.0
522	P 6–b	6.0P 3.2/1.5	570	Pb 6–b	7.2P 3.6/2.4
523	P 6–c	0.3RP 4.1/2.3	571	Pb 6–c	6.0P 4.4/2.5
524	P 6–d	1.2RP 4.8/2.3	572	Pb 6–d	7.0P 5.2/3.0
525	P 6–e	1.8RP 6.0/2.6	573	Pb 6–e	8.0P 6.3/3.0
526	P 6–f	10.0P 7.2/2.8	574	Pb 6–f	8.5P 7.0/3.5
527	P 6–g	1.8RP 7.8/3.5	575	Pb 6–g	1.0RP 7.8/3
528	P 6–h	1.3RP 8.8/3	576	Pb 6–h	?1RP 9/2?

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
577	Bp 1–a	9.6PB 3.1/9.5	625	B 1–a	8.0PB 2.8/14
578	Bp 1–b	0.4P 4.2/10.0	626	B 1–b	8.0PB 3.8/13
579	Bp 1–c	0.5P 5.2/9.5	627	B 1–c	8.0PB 5.6/13
580	Bp 1–d	1.0P 6.3/8.5	628	B 1–d	7.5PB 6.4/12
581	Bp 1–e	1.3P 7.2/7.5	629	B 1–e	7.0PB 7.5/10
582	Bp 1–f	2P 8.3/6	630	B 1–f	6.7PB 8.5/7?
583	Bp 1–g	3P 9/3?	631	B 1–g	6.5PB 9.2/5?
584	Bp 1–h	? >9/1?	632	B 1–h	6PB >9/3?
585	Bp 2–a	9.6PB 3.1/7.5	633	B 2–a	8.0PB 3.0/9.0
586	Bp 2–b	0.5P 4.0/8.5	634	B 2–b	7.2PB 4.3/10.5
587	Bp 2–c	0.8P 5.2/5.6	635	B 2–c	7.0PB 5.8/9.5
588	Bp 2–d	1.8P 6.3/5.6	636	B 2–d	6.8PB 6.8/8.5
589	Bp 2–e	2.0P 7.4/5.3	637	B 2–e	6.5PB 7.6/7
590	Bp 2–f	2.5P 8.2/4	638	B 2–f	6.5PB 8.6/5
591	Bp 2–g	3P 9/2?	639	B 2–g	6.0PB 9.3/3?
592	Bp 2–h	? >9/1?	640	B 2–h	6PB <9/2?
593	Bp 3–a	9.6PB 2.7/3.6	641	B 3–a	6.0PB 2.8/4.5
594	Bp 3–b	0.4P 3.9/6.0	642	B 3–b	5.8PB 4.1/5.2
595	Bp 3–c	1.0P 5.2/5.6	643	B 3–c	5.5PB 5.3/6.0
596	Bp 3–d	2.0P 6.3/5.0	644	B 3–d	5.5PB 6.7/6.0
597	Bp 3–e	2.5P 7.2/4.7	645	B 3–e	5.5PB 7.7/6
598	Bp 3–f	2.5P 8.3/4	646	B 3–f	5PB 8.2/4
599	Bp 3–g	4P 9/2	647	B 3–g	5PB 9.1/3
600	Bp 3–h	?5P >9/1?	648	B 3–h	?5PB >9/1?
601	Bp 4–a	8.8PB 2.6/2.4	649	B 4–a	5.5PB 2.7/3.0
602	Bp 4–b	0.5P 3.6/3.0	650	B 4–b	5.5PB 3.9/4.0
603	Bp 4–c	2.0P 5.2/3.0	651	B 4–c	5.0PB 5.2/4.5
604	Bp 4–d	2.5P 5.8/3.6	652	B 4–d	5.0PB 6.0/4.0
605	Bp 4–e	2.0P 7.3/4.0	653	B 4–e	5.5PB 6.9/3.5
606	Bp 4–f	3P 8.3/3	654	B 4–f	5.5PB 8.2/3.0
607	Bp 4–g	3P 9/2	655	B 4–g	5PB 8.9/2
608	Bp 4–h	? >9/1?	656	B 4–h	?5PB >9/1?
609	Bp 5–a	8.5PB 2.5/0.7	657	B 5–a	5.0PB 2.3/2.0
610	Bp 5–b	9.0PB 3.7/1.5	658	B 5–b	4.5PB 3.8/3.5
611	Bp 5–c	0.4P 4.9/2.0	659	B 5–c	5.0PB 4.8/3.5
612	Bp 5–d	0.5P 6.2/2.4	660	B 5–d	5.5PB 5.9/3.0
613	Bp 5–e	1.5P 6.8/3.0	661	B 5–e	5.5PB 6.8/2.7
614	Bp 5–f	2.5P 7.8/2.0	662	B 5–f	6.0PB 7.7/2.5
615	Bp 5–g	3P 8.5/1	663	B 5–g	6PB 8.6/2
616	Bp 5–h	?3P 9.2/ <1	664	B 5–h	6PB >9/1?
617	Bp 6–a	9.0PB 2.9/0.5	665	B 6–a	5PB 2.4/1.0
618	Bp 6–b	9.5PB 3.7/0.5	666	B 6–b	5.0PB 3.8/1.5
619	Bp 6–c	0.5P 5.2/0.8	667	B 6–c	4.2PB 5.2/2.0
620	Bp 6–d	1.0P 5.7/1.0	668	B 6–d	5.0PB 5.8/1.5
621	Bp 6–e	1.0P 6.9/1.3	669	B 6–e	5.5PB 6.7/1.5
622	Bp 6–f	1P 7.8/1.5	670	B 6–f	6.0PB 7.6/1.5
623	Bp 6–g	1.5P 8.5/1	671	B 6–g	6.5PB 8.6/1.5
624	Bp 6–h	1.5P 9.2/ <1	672	B 6–h	?7PB >9/1

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
673	Bg 1–a	7.8PB 2.3/10.5	721	Bgg 1–a	7.0PB 2.6/6.0
674	Bg 1–b	7.0PB 4.0/14.0	722	Bgg 1–b	4.5PB 3.3/12
675	Bg 1–c	6.0PB 4.8/12.5	723	Bgg 1–c	3.2PB 4.5/13
676	Bg 1–d	4.5PB 6.3/11.0	724	Bgg 1–d	2.5PB 5.4/12
677	Bg 1–e	4.0PB 7.5/9	725	Bgg 1–e	2.0PB 6.3/10
678	Bg 1–f	4PB 8.3/6	726	Bgg 1–f	1.0PB 7.5/8
679	Bg 1–g	3PB 9.0/3?	727	Bgg 1–g	1PB 8.6/6
680	Bg 1–h	?3PB >9/1?	728	Bgg 1–h	10B >9/3
681	Bg 2–a	7.0PB 2.5/6.0	729	Bgg 2–a	4.5PB 2.1/5.0
682	Bg 2–b	7.0PB 4.2/8.5	730	Bgg 2–b	3.0PB 3.1/8.5
683	Bg 2–c	6.8PB 5.1/9.0	731	Bgg 2–c	2.0PB 4.3/8.0
684	Bg 2–d	5.5PB 6.6/8.0	732	Bgg 2–d	2.0PB 5.1/8.0
685	Bg 2–e	5.5PB 7.3/5.3	733	Bgg 2–e	1.5PB 6.2/7.0
686	Bg 2–f	4.5PB 8.2/4	734	Bgg 2–f	1.0PB 6.9/6.5
687	Bg 2–g	4PB 9.0/3?	735	Bgg 2–g	1PB 7.8/4
688	Bg 2–h	?5PB >9/2?	736	Bgg 2–h	1PB 8.8/3
689	Bg 3–a	5.0PB 2.3/3.3	737	Bgg 3–a	1.3PB 2.5/2.5
690	Bg 3–b	5.0PB 3.9/5.6	738	Bgg 3–b	1.0PB 3.2/6.5
691	Bg 3–c	5.5PB 4.9/5.6	739	Bgg 3–c	1.3PB 4.3/7.5
692	Bg 3–d	5.0PB 6.3/5.5	740	Bgg 3–d	1.5PB 5.4/7.5
693	Bg 3–e	5.8PB 7.6/4.5	741	Bgg 3–e	0.5PB 6.3/6.5
694	Bg 3–f	6.0PB 8.1/4.0	742	Bgg 3–f	0.5PB 6.9/6.0
695	Bg 3–g	6.5PB 8.8/3.5	743	Bgg 3–g	0.5PB 7.8/5
696	Bg 3–h	7PB >9/2?	744	Bgg 3–h	1.3PB 8.4/4
697	Bg 4–a	5.0PB 2.3/2.4	745	Bgg 4–a	5PB 2.0/1.3
698	Bg 4–b	4.6PB 3.9/3.3	746	Bgg 4–b	10.0B 2.9/3.5
699	Bg 4–c	5.4PB 5.1/4.0	747	Bgg 4–c	9.0B 4.1/5.2
700	Bg 4–d	5.6PB 5.8/3.5	748	Bgg 4–d	9.0B 4.8/5.5
701	Bg 4–e	6.3PB 7.1/3.0	749	Bgg 4–e	9.5B 5.8/5.5
702	Bg 4–f	6.8PB 8.0/2.5	750	Bgg 4–f	0.5PB 7.2/6.0
703	Bg 4–g	7PB 8.8/2	751	Bgg 4–g	1.0PB 8.1/4.5
704	Bg 4–h	?8PB >9/1	752	Bgg 4–h	2PB 8.6/3
705	Bg 5–a	5.0PB 2.3/2.0	753	Bgg 5–a	6PB 2.2/0.7
706	Bg 5–b	4.5PB 3.8/2.5	754	Bgg 5–b	8B 2.7/1.3
707	Bg 5–c	4.0PB 4.8/2.7	755	Bgg 5–c	8.5B 3.9/3.5
708	Bg 5–d	4.5PB 5.8/2.5	756	Bgg 5–d	9.0B 4.8/4.0
709	Bg 5–e	6.0PB 6.7/1.8	757	Bgg 5–e	9.5B 6.3/4.0
710	Bg 5–f	6.5PB 7.5/2	758	Bgg 5–f	0.5PB 7.4/3.2
711	Bg 5–g	7PB 8.6/2	759	Bgg 5–g	1.5PB 7.7/3
712	Bg 5–h	?8PB >9/1?	760	Bgg 5–h	1PB 8.4/2
713	Bg 6–a	6PB 2.4/0.7	761	Bgg 6–a	2PB 2.3/0.5
714	Bg 6–b	5.5PB 3.7/1.5	762	Bgg 6–b	8.0B 3.0/1.3
715	Bg 6–c	5.5PB 5.2/2.0	763	Bgg 6–c	8.0B 4.2/2.0
716	Bg 6–d	6.2PB 5.8/2.0	764	Bgg 6–d	8.5B 4.8/3.5
717	Bg 6–e	7.0PB 6.8/2.0	765	Bgg 6–e	9.5B 6.1/3.0
718	Bg 6–f	7PB 7.2/1.5	766	Bgg 6–f	0.5PB 6.5/3.2
719	Bg 6–g	8PB 8.0/1.5	767	Bgg 6–g	1.0PB 7.5/3.0
720	Bg 6–h	9PB 8.6/1	768	Bgg 6–h	?2PB 8.5/2

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
769	BG 1–a	1.0PB 2.8/4.5	817	Gbb 1–a	4.0B 3.0/4.0
770	BG 1–b	9.0B 3.6/7.5	818	Gbb 1–b	3.0B 3.6/6.5
771	BG 1–c	6.0B 4.9/9	819	Gbb 1–c	2.0B 5.1/7.5
772	BG 1–d	7B 5.7/9?	820	Gbb 1–d	2B 5.8/8?
773	BG 1–e	7.5B 6.8/8.5	821	Gbb 1–e	2.5B 6.8/8
774	BG 1–f	8.0B 7.6/7	822	Gbb 1–f	3.0B 7.4/6.5
775	BG 1–g	8.5B 8.7/5	823	Gbb 1–g	3.0B 8.4/5
776	BG 1–h	9B 9/3	824	Gbb 1–h	3B 9/4
777	BG 2–a	2.5PB 2.4/3.0	825	Gbb 2–a	4.0B 2.8/2.5
778	BG 2–b	9.2B 3.4/6.5	826	Gbb 2–b	2.0B 3.3/6.0
779	BG 2–c	7.0B 4.6/8	827	Gbb 2–c	2.0B 4.4/6.8
780	BG 2–d	7.5B 5.4/8	828	Gbb 2–d	2.5B 5.7/7
781	BG 2–e	9.0B 6.5/7	829	Gbb 2–e	3.0B 6.6/6.5
782	BG 2–f	8.5B 7.3/7	830	Gbb 2–f	3.0B 7.4/5.5
783	BG 2–g	8.0B 8.0/5	831	Gbb 2–g	3.0B 7.7/4.5
784	BG 2–h	7B 9/3	832	Gbb 2–h	3B 8.6/4
785	BG 3–a	1.0PB 2.2/1.5	833	Gbb 3–a	6B 2.4/1.5
786	BG 3–b	8.0B 3.1/2.5	834	Gbb 3–b	3.0B 3.5/3.5
787	BG 3–c	7.5B 4.2/3.0	835	Gbb 3–c	1.5B 4.5/5.0
788	BG 3–d	8.0B 5.6/5.0	836	Gbb 3–d	3.5B 5.7/5.5
789	BG 3–e	8.5B 6.7/6.0	837	Gbb 3–e	4.0B 6.6/6.5
790	BG 3–f	8.0B 7.3/6.0	838	Gbb 3–f	3.3B 7.2/5.0
791	BG 3–g	7.5B 7.8/4.0	839	Gbb 3–g	4.2B 8.0/4.5
792	BG 3–h	7.0B 7.7/3.5	840	Gbb 3–h	6B 8.2/4
793	BG 4–a	4PB 2.1/1	841	Gbb 4–a	9B 2.4/0.5
794	BG 4–b	7.0B 3.0/2.0	842	Gbb 4–b	3.0B 3.0/1.5
795	BG 4–c	7.0B 3.9/3.5	843	Gbb 4–c	3.0B 4.2/3.5
796	BG 4–d	6.5B 4.6/4.0	844	Gbb 4–d	2.5B 5.1/4.0
797	BG 4–e	6.0B 6.0/4.0	845	Gbb 4–e	2.0B 6.2/3.5
798	BG 4–f	8.5B 7.1/4.5	846	Gbb 4–f	4.5B 7.8/3.5
799	BG 4–g	9.5B 8.1/3.5	847	Gbb 4–g	4.5B 8.2/2.5
800	BG 4–h	?8B 8.4/2.5	848	Gbb 4–h	?4B 8.9/2
801	BG 5–a	4PB 2.3/0.5	849	Gbb 5–a	2PB 1.8/0.5
802	BG 5–b	9B 3.1/2.5	850	Gbb 5–b	4.0B 2.8/1.3
803	BG 5–c	7.0B 4.0/2.5	851	Gbb 5–c	3.5B 3.8/3.0
804	BG 5–d	6.0B 5.3/2.5	852	Gbb 5–d	3.0B 5.1/3.5
805	BG 5–e	5.5B 6.3/2.0	853	Gbb 5–e	1.5B 6.1/3.0
806	BG 5–f	6.5B 6.8/2.0	854	Gbb 5–f	3.0B 6.7/3.0
807	BG 5–g	9.0B 7.9/2	855	Gbb 5–g	4.0B 7.7/2.5
808	BG 5–h	9.5B 8.3/2	856	Gbb 5–h	5B 8.2/2.0
809	BG 6–a	4PB 2.4/0.4	857	Gbb 6–a	?5PB 1.5/0.4?
810	BG 6–b	9.0B 3.1/2.4	858	Gbb 6–b	?3B 2.6/0.8
811	BG 6–c	6.5B 4.0/2.0	859	Gbb 6–c	4B 4.4/1.6
812	BG 6–d	7.5B 5.1/1.5	860	Gbb 6–d	3B 5.3/2.4
813	BG 6–e	8.0B 6.3/1.5	861	Gbb 6–e	3B 6.5/2.0
814	BG 6–f	9.0B 6.8/1.5	862	Gbb 6–f	4B 6.9/1.6
815	BG 6–g	1.0PB 7.7/1	863	Gbb 6–g	6B 7.7/1.3
816	BG 6–h	0.5PB 8.2/1	864	Gbb 6–h	10B 8.4/1

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color		Plochere number	Plochere code	Munsell color	
865	Gb 1–a	9.0BG	3.2/6.0	913	G 1–a	3.5BG	3.2/5.5
866	Gb 1–b	7.0BG	4.2/6.5	914	G 1–b	3.0BG	4.5/6.0
867	Gb 1–c	7.0BG	5.2/8	915	G 1–c	3.0BG	5.4/8
868	Gb 1–d	8.0BG	5.7/9	916	G 1–d	2.5BG	6.2/9?
869	Gb 1–e	9BG	6.7/9?	917	G 1–e	2BG	7.3/8
870	Gb 1–f	8BG	7.9/7?	918	G 1–f	3BG	8.3/5
871	Gb 1–g	9BG	8.8/5?	919	G 1–g	4BG	9.0/4
872	Gb 1–h	?10BG	>9/2	920	G 1–h	?4BG	>9/2
873	Gb 2–a	9.0BG	2.8/3.0	921	G 2–a	6.0BG	2.8/3.6
874	Gb 2–b	9.0BG	4.1/6.0	922	G 2–b	3.5BG	4.0/5.6
875	Gb 2–c	8.0BG	4.9/6.0	923	G 2–c	4.0BG	5.1/7.0
876	Gb 2–d	7.5BG	5.7/8	924	G 2–d	3.5BG	5.8/8
877	Gb 2–e	8.8BG	6.6/8?	925	G 2–e	4.0BG	6.7/8?
878	Gb 2–f	8BG	7.6/6?	926	G 2–f	3.0BG	7.5/7?
879	Gb 2–g	8BG	8.3/4.5	927	G 2–g	4BG	8.3/4
880	Gb 2–h	9BG	9.2/3?	928	G 2–h	5BG	9.0/2
881	Gb 3–a	10BG	2.7/1.5	929	G 3–a	9BG	2.6/2.0
882	Gb 3–b	8.5BG	3.6/3.5	930	G 3–b	5.0BG	3.7/4.4
883	Gb 3–c	8.5BG	4.5/4.5	931	G 3–c	4.0BG	4.6/5.0
884	Gb 3–d	9.0BG	5.6/5.5	932	G 3–d	3.8BG	5.4/5.5
885	Gb 3–e	9.0BG	6.5/6.0	933	G 3–e	4.5BG	6.0/6.0
886	Gb 3–f	8.8BG	7.7/5.0	934	G 3–f	6.0BG	7.4/6.0
887	Gb 3–g	8.5BG	8.3/4	935	G 3–g	6.5BG	8.4/4.0
888	Gb 3–h	?8BG	8.9/4?	936	G 3–h	7BG	8.6/3.0
889	Gb 4–a	1.5B	2.1/1.3	937	G 4–a	1B	2.4/1.0
890	Gb 4–b	0.5B	3.6/2.8	938	G 4–b	6.2BG	3.5/2.5
891	Gb 4–c	0.5B	4.7/3.5	939	G 4–c	5.5BG	4.5/3.5
892	Gb 4–d	9.0BG	5.2/4.4	940	G 4–d	6.0BG	5.2/3.5
893	Gb 4–e	9.5BG	6.2/4.0	941	G 4–e	6.8BG	6.2/4.0
894	Gb 4–f	10.0BG	7.4/3.5	942	G 4–f	8.0BG	7.8/3.5
895	Gb 4–g	1.0B	8.4/3.5	943	G 4–g	9BG	8.4/2.5
896	Gb 4–h	1B	9.0/3	944	G 4–h	9BG	8.8/2
897	Gb 5–a	4B	2.0/1.0	945	G 5–a	2B	2.1/0.5
898	Gb 5–b	2.0B	3.3/2.0	946	G 5–b	7BG	3.8/1.5
899	Gb 5–c	1.0B	4.3/3.0	947	G 5–c	6.0BG	4.4/2.0
900	Gb 5–d	1.0B	5.2/3.0	948	G 5–d	5.5BG	5.2/2.5
901	Gb 5–e	1.3B	6.3/2.8	949	G 5–e	5.8BG	6.1/2.7
902	Gb 5–f	1.5B	7.4/2.8	950	G 5–f	6.0BG	6.8/3.0
903	Gb 5–g	2.0B	8.4/2.0	951	G 5–g	7.5BG	7.6/2.5
904	Gb 5–h	2.0B	8.7/1.5?	952	G 5–h	8.5BG	8.2/2.0
905	Gb 6–a	?6B	2.3/0.5	953	G 6–a	5B	2.0/0.4?
906	Gb 6–b	?2B	3.3/1.0	954	G 6–b	1.0B	3.3/1.0
907	Gb 6–c	1.5B	4.3/1.5	955	G 6–c	9.5BG	4.2/1.6
908	Gb 6–d	1.0B	5.2/2.0	956	G 6–d	9.0BG	5.1/2.0
909	Gb 6–e	0.5B	6.0/2.0	957	G 6–e	10.0BG	6.2/2.0
910	Gb 6–f	10BG	6.7/2.0	958	G 6–f	9.5BG	7.2/1.6
911	Gb 6–g	1B	7.3/1.5	959	G 6–g	1.0B	7.7/1.5
912	Gb 6–h	2B	8.2/1.5	960	G 6–h	2B	8.4/1

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
961	Gy 1–a	2.0BG 3.1/7	1009	Gyy 1–a	5.0G 4.3/11?
962	Gy 1–b	9.5G 4.6/8	1010	Gyy 1–b	4.5G 5.4/12?
963	Gy 1–c	9.0G 5.5/9?	1011	Gyy 1–c	4.0G 6.1/12?
964	Gy 1–d	9.0G 6.2/9?	1012	Gyy 1–d	4.0G 6.7/10?
965	Gy 1–e	0.5BG 6.8/9?	1013	Gyy 1–e	4.5G 7.5/8.0
966	Gy 1–f	1.0BG 8.2/8?	1014	Gyy 1–f	5.5G 8.4/7
967	Gy 1–g	1.5BG 8.6/6?	1015	Gyy 1–g	6.0G 9/4
968	Gy 1–h	2BG >9/4?	1016	Gyy 1–h	?7G >9/2
869	Gy 2–a	1.0BG 3.0/4.0	1017	Gyy 2–a	4.5G 3.3/6
970	Gy 2–b	10.0G 4.6/5.6	1018	Gyy 2–b	4.5G 4.8/8.0
971	Gy 2–c	0.8BG 5.3/6.5	1019	Gyy 2–c	4.5G 5.8/7.5
972	Gy 2–d	1.0BG 6.0/7.0	1020	Gyy 2–d	4.2G 6.8/7.0
973	Gy 2–e	1.0BG 6.8/6.5	1021	Gyy 2–e	5.5G 7.8/7.0
974	Gy 2–f	1.5BG 7.6/6?	1022	Gyy 2–f	5.7G 8.3/6.0
975	Gy 2–g	?2BG 8.8/4	1023	Gyy 2–g	6G 8.9/4
976	Gy 2–h	?5BG >9/1?	1024	Gyy 2–h	7G >9/2
977	Gy 3–a	2.5BG 2.7/2.0	1025	Gyy 3–a	7.0G 2.9/2.2
978	Gy 3–b	0.8BG 3.9/3.5	1026	Gyy 3–b	6.3G 3.9/3.6
979	Gy 3–c	1.5BG 4.8/4.5	1027	Gyy 3–c	6.5G 5.2/4.0
980	Gy 3–d	2.5BG 5.4/5.0	1028	Gyy 3–d	6.0G 5.9/4.5
981	Gy 3–e	3.5BG 6.2/5.0	1029	Gyy 3–e	5.5G 6.9/4.0
982	Gy 3–f	3.5BG 7.3/5	1030	Gyy 3–f	6.5G 8.0/3.5
983	Gy 3–g	3BG 8.4/4	1031	Gyy 3–g	6.5G 8.5/2.5
984	Gy 3–h	?5BG >9/2?	1032	Gyy 3–h	7G 9/2
985	Gy 4–a	?3BG 2.3/1.6	1033	Gyy 4–a	8G 2.3/2.0
986	Gy 4–b	1.0BG 3.7/2.5	1034	Gyy 4–b	6.0G 3.8/2.5
987	Gy 4–c	3.5BG 4.2/3.5	1035	Gyy 4–c	6.0G 5.1/3.0
988	Gy 4–d	3.8BG 5.2/3.5	1036	Gyy 4–d	6.5G 5.7/2.7
989	Gy 4–e	3.5BG 6.0/3.2	1037	Gyy 4–e	7.0G 6.6/3.0
990	Gy 4–f	4.0BG 7.4/3.0	1038	Gyy 4–f	7.5G 7.8/2.7
991	Gy 4–g	5.0BG 8.6/2.4	1039	Gyy 4–g	7.5G 8.6/2.0
992	Gy 4–h	7BG 9.0/2	1040	Gyy 4–h	8G 9.0/1.5?
993	Gy 5–a	7BG 1.8/1.5	1041	Gyy 5–a	9G 2.4/1.0
994	Gy 5–b	3.8BG 3.2/1.6	1042	Gyy 5–b	8.5G 3.5/1.5
995	Gy 5–c	4.0BG 4.4/2.8	1043	Gyy 5–c	8.3G 4.8/2.0
996	Gy 5–d	4.5BG 5.3/2.5	1044	Gyy 5–d	10.0G 5.1/2.0
997	Gy 5–e	4.5BG 6.2/2.4	1045	Gyy 5–e	10.0G 6.6/1.5
998	Gy 5–f	5.5BG 6.5/2.5	1046	Gyy 5–f	1.0BG 6.9/1.5
999	Gy 5–g	6.0BG 7.7/2.5	1047	Gyy 5–g	2BG 7.8/1.3
1000	Gy 5–h	7BG 8.4/2	1048	Gyy 5–h	2BG 8.6/1
1001	Gy 6–a	?10BG 2.3/1	1049	Gyy 6–a	4BG 2.5/0.5
1002	Gy 6–b	6BG 3.4/1.5	1050	Gyy 6–b	2BG 3.7/1.0
1003	Gy 6–c	6.5BG 4.4/2.0	1051	Gyy 6–c	2BG 4.9/1.0
1004	Gy 6–d	6.8BG 5.2/2.4	1052	Gyy 6–d	3BG 5.6/0.7
1005	Gy 6–e	6.5BG 6.1/2.4	1053	Gyy 6–e	?4BG 6.4/0.7
1006	Gy 6–f	7.0BG 6.8/2.0	1054	Gyy 6–f	?4BG 6.7/0.5
1007	Gy 6–g	9.0BG 7.7/2.0	1055	Gyy 6–g	5BG 7.7/0.5
1008	Gy 6–h	10BG 8.4/1.5	1056	Gyy 6–h	?7BG 8.5/0.3

TABLE II—*Continued*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Continued*

Plochere number	Plochere code	Munsell color		Plochere number	Plochere code	Munsell color	
1057	GY 1–a	3.8G	4.8/12?	1105	Ygg 1–a	9GY	6.3/14?
1058	GY 1–b	2.5G	5.8/12	1106	Ygg 1–b	9.5GY	7.0/12?
1059	GY 1–c	2.0G	6.7/11	1107	Ygg 1–c	9.0GY	7.7/11
1060	GY 1–d	2.0G	7.3/10	1108	Ygg 1–d	8.0GY	8.5/9.0
1061	GY 1–e	1.8G	8.2/9.0	1109	Ygg 1–e	7.5GY	8.8/7.5
1062	GY 1–f	1.3G	8.8/7.0	1110	Ygg 1–f	6.5GY	9.2/5.0
1063	GY 1–g	1G	>9/4	1111	Ygg 1–g	5GY	>9/4
1064	GY 1–h	?10GY	>9/2	1112	Ygg 1–h	?5GY	>9/1?
1065	GY 2–a	2.5G	3.8/6.0	1113	Ygg 2–a	9.5GY	5.4/10.5
1066	GY 2–b	2.0G	5.1/7.0	1114	Ygg 2–b	9.0GY	6.5/9.0
1067	GY 2–c	1.5G	6.2/6.7	1115	Ygg 2–c	7.8GY	7.1/7.6
1068	GY 2–d	1.3G	7.0/5.6	1116	Ygg 2–d	7.2GY	7.9/7.2
1069	GY 2–e	1.3G	8.0/6.0	1117	Ygg 2–e	6.5GY	8.7/6.5
1070	GY 2–f	1.0G	8.5/4.0	1118	Ygg 2–f	6.0GY	9.0/5.0
1071	GY 2–g	1G	9.0/3	1119	Ygg 2–g	5GY	>9/4?
1072	GY 2–h	?10GY	>9/1	1120	Ygg 2–h	?5GY	>9/1?
1073	GY 3–a	2.5G	3.1/3.0	1121	Ygg 3–a	8.0GY	4.1/6.5
1074	GY 3–b	1.0G	4.8/4.4	1122	Ygg 3–b	7.2GY	5.2/6.0
1075	GY 3–c	1.0G	5.8/4.4	1123	Ygg 3–c	7.0GY	6.3/5.5
1076	GY 3–d	0.5G	6.4/3.6	1124	Ygg 3–d	6.8GY	6.8/5.2
1077	GY 3–e	0.5G	7.0/3.5	1125	Ygg 3–e	6.0GY	7.8/5.0
1078	GY 3–f	10.0GY	8.3/2.5	1126	Ygg 3–f	5.5GY	8.5/4.0
1079	GY 3–g	10GY	9/1.5	1127	Ygg 3–g	5.0GY	9.2/3
1080	GY 3–h	?10GY	>9/1	1128	Ygg 3–h	?5GY	>9/1?
1081	GY 4–a	3.5G	2.7/1.5	1129	Ygg 4–a	7.5GY	3.4/4.5
1082	GY 4–b	1.0G	3.8/3.2	1130	Ygg 4–b	7.0GY	4.8/4.5
1083	GY 4–c	1.0G	5.0/3.5	1131	Ygg 4–c	6.0GY	5.7/4.0
1084	GY 4–d	0.5G	6.0/3.5	1132	Ygg 4–d	5.5GY	6.4/3.5
1085	GY 4–e	10.0GY	7.0/3.0	1133	Ygg 4–e	5.0GY	7.3/3.2
1086	GY 4–f	1.0G	8.0/2.0	1134	Ygg 4–f	4.5GY	8.5/3.0
1087	GY 4–g	2.5G	8.8/1.0	1135	Ygg 4–g	4.5GY	9.0/2.5
1088	GY 4–h	?3G	>9/0.7?	1136	Ygg 4–h	?4GY	>9/1
1089	GY 5–a	2.5G	2.3/0.8	1137	Ygg 5–a	7.5GY	3.1/2.0
1090	GY 5–b	2.0G	3.5/1.5	1138	Ygg 5–b	7.0GY	3.8/2.8
1091	GY 5–c	1.3G	4.9/1.6	1139	Ygg 5–c	6.5GY	5.3/3.0
1092	GY 5–d	0.8G	5.8/2.0	1140	Ygg 5–d	5.8GY	6.2/2.8
1093	GY 5–e	0.5G	6.9/1.5	1141	Ygg 5–e	5.5GY	7.2/2.5
1094	GY 5–f	10.0GY	7.6/1.0	1142	Ygg 5–f	5.0GY	7.7/2.5
1095	GY 5–g	10GY	8.0/0.8	1143	Ygg 5–g	5GY	8.1/1.5
1096	GY 5–h	?10GY	8.5/0.5	1144	Ygg 5–h	?4GY	8.7/1
1097	GY 6–a	3G	2.1/0.5	1145	Ygg 6–a	6GY	2.5/1.5
1098	GY 6–b	2G	3.8/1.0	1146	Ygg 6–b	6.0GY	3.9/2.0
1099	GY 6–c	1G	4.6/0.8	1147	Ygg 6–c	6.5GY	5.0/1.8
1100	GY 6–d	1G	5.7/1.0	1148	Ygg 6–d	6.5GY	5.4/1.8
1101	GY 6–e	10GY	6.6/1.0	1149	Ygg 6–e	5.8GY	6.9/1.6
1102	GY 6–f	10GY	7.2/1.0	1150	Ygg 6–f	5.5GY	7.3/1.2
1103	GY 6–g	?10GY	7.8/0.7	1151	Ygg 6–g	5GY	8.0/1.0
1104	GY 6–h	?10GY	8.5/0.5	1152	Ygg 6–h	?4GY	8.6/0.5

TABLE II—*Concluded*

COMPARISON OF PLOCHERE COLORS WITH MUNSELL BOOK OF COLOR—*Concluded*

Plochere number	Plochere code	Munsell color	Plochere number	Plochere code	Munsell color
1153	Yg 1–a	6.5GY 7.6/13	1201	YYg 1–a	2.0GY 8.0/10
1154	Yg 1–b	4.5GY 8.5/11	1202	YYg 1–b	1.5GY 8.8/10.0
1155	Yg 1–c	3.5GY 8.9/10	1203	YYg 1–c	1.0GY 8.9/9.0
1156	Yg 1–d	2.5GY 9.2/9	1204	YYg 1–d	10Y 9.0/8
1157	Yg 1–e	2GY >9/7	1205	YYg 1–e	10Y 9.1/7?
1158	Yg 1–f	1GY >9/6	1206	YYg 1–f	9Y 9.2/6?
1159	Yg 1–g	1GY >9/3	1207	YYg 1–g	9Y >9/4?
1160	Yg 1–h	?10Y >9/1	1208	YYg 1–h	8Y >9/1?
1161	Yg 2–a	5.8GY 7.0/11.0	1209	YYg 2–a	1.5GY 7.4/8.0
1162	Yg 2–b	4.5GY 7.8/8.0	1210	YYg 2–b	0.5GY 8.0/8.0
1163	Yg 2–c	3.0GY 8.3/8.0	1211	YYg 2–c	10.0Y 8.8/8
1164	Yg 2–d	2.5GY 8.9/6.5	1212	YYg 2–d	9.0Y 9/7
1165	Yg 2–e	2.0GY 9.2/6.0	1213	YYg 2–e	9Y >9/6
1166	Yg 2–f	1.5GY >9/5	1214	YYg 2–f	9Y >9/4
1167	Yg 2–g	1GY >9/4?	1215	YYg 2–g	8Y >9/2
1168	Yg 2–h	10Y >9/1?	1216	YYg 2–h	?7Y >9/1
1169	Yg 3–a	4.5GY8 5.9/8.	1217	YYg 3–a	2.0GY 5.8/7.6
1170	Yg 3–b	3.2GY 7.0/8.0	1218	YYg 3–b	1.5GY 6.8/7.0
1171	Yg 3–c	2.5GY 7.8/7.0	1219	YYg 3–c	1.8GY 7.8/7.0
1172	Yg 3–d	2.5GY 8.3/6.0	1220	YYg 3–d	1.5GY 8.4/6.7
1173	Yg 3–e	2.0GY 9.0/5.0	1221	YYg 3–e	0.5GY 8.9/6.0
1174	Yg 3–f	1.5GY >9/4.5	1222	YYg 3–f	10Y >9/5
1175	Yg 3–g	1GY >9/4	1223	YYg 3–g	10Y >9/4
1176	Yg 3–h	?10Y >9/1?	1224	YYg 3–h	10Y >9/3
1177	Yg 4–a	4.5GY 4.6/4.5	1225	YYg 4–a	4.0GY 4.6/5.5
1178	Yg 4–b	4.0GY 5.5/5.5	1226	YYg 4–b	3.0GY 5.4/6.0
1179	Yg 4–c	3.0GY 6.5/5.5	1227	YYg 4–c	2.5GY 6.6/5.0
1180	Yg 4–d	2.5GY 7.2/5.0	1228	YYg 4–d	1.8GY 7.2/5.0
1181	Yg 4–e	2.0GY 7.8/4.5	1229	YYg 4–e	1.8GY 7.9/4.7
1182	Yg 4–f	2.0GY 8.1/4.5	1230	YYg 4–f	1.0GY 8.9/3
1183	Yg 4–g	2GY 8.6/3.5	1231	YYg 4–g	1GY >9/3?
1184	Yg 4–h	1GY >9/1?	1232	YYg 4–h	10Y >9/2?
1185	Yg 5–a	6.0GY 3.3/4.0	1233	YYg 5–a	5.0GY 3.5/4.4
1186	Yg 5–b	5.0GY 4.6/3.5	1234	YYg 5–b	4.0GY 4.6/4.0
1187	Yg 5–c	4.5GY 5.5/3.5	1235	YYg 5–c	4.0GY 5.7/3.6
1188	Yg 5–d	4.0GY 6.5/3.5	1236	YYg 5–d	3.2GY 6.5/3.5
1189	Yg 5–e	3.3GY 7.4/3.0	1237	YYg 5–e	2.5GY 7.3/3.5
1190	Yg 5–f	3.0GY 7.8/2.8	1238	YYg 5–f	2.0GY 7.8/3.0
1191	Yg 5–g	2.5GY 8.1/2.5	1239	YYg 5–g	1.5GY 8.5/2.4
1192	Yg 5–h	2GY 8.8/2	1240	YYg 5–h	1GY 9.0/2
1193	Yg 6–a	6.5GY 2.7/1.5	1241	YYg 6–a	6.0GY 2.7/2.0
1194	Yg 6–b	5.0GY 3.9/2.0	1242	YYg 6–b	5.0GY 3.9/2.5
1195	Yg 6–c	4.5GY 5.1/2.4	1243	YYg 6–c	4.2GY 5.3/2.0
1196	Yg 6–d	4.5GY 6.0/2.4	1244	YYg 6–d	4.0GY 6.2/2.0
1197	Yg 6–e	3.5GY 6.9/1.6	1245	YYg 6–e	3.0GY 7.0/1.6
1198	Yg 6–f	3.0GY 7.3/1.6	1246	YYg 6–f	2.5GY 7.4/1.5
1199	Yg 6–g	2.5GY 7.9/1.2	1247	YYg 6–g	2.0GY 8.1/1.2
1200	Yg 6–h	2GY 8.5/1	1248	YYg 6–h	?1GY 8.9/1

and the occasional shifts of hue, produced by the addition of black* or other modifying pigments. It is clear that the hue changes were not intended, but arose from the mixture of pigments. The marked changes following numbers 1, 49, 97, and 145 appear to be due to the addition of raw sienna.

The hues are fairly regularly distributed with the exception of a large hiatus in the region of 7.5 P, which is filled in to some extent in the low chroma series. Probably this hue is not much used nowadays in higher chromas. There is also a break at 10Y which is very clearly marked except in the series of highest chroma (1201–1208 and 1–8).

A distinct impression was felt during the matching that the hues between RP and G through B tended to go towards blue with the addition of black. This is confirmed by Fig. 1.

A similar polar plot of value against hue was prepared but is not reproduced. It shows the same general features, but less clearly.

Two of the blocks, beginning with 625 and 673, are very similar as far as their leading colors are concerned, but produce delicately different results when mixed with white, so that their separate existence may be desirable from the standpoint of the decorator. The writer has no desire to go at this time into the elusive subject of pigment mixture, but colors 681–688 and 721–728 offer a most interesting study. The leading colors of these series are very nearly alike, their color difference measured on the Hunter reflectometer (4) being only 2.2 judd. Mixture with white, however, produces widely different tints, the color difference between 722 and 682 for example, being 18 judd. The course of the two series in value and chroma is indicated in Fig. 2, in which the small circles indicate the series 721–728, the black dots the series 681–688.

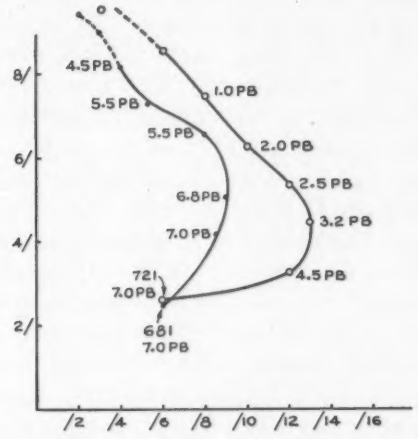

FIG. 2. *Value and chroma of two series of which the leading colors are very nearly alike.*

* *It is stated (8, p. 9) that "as there is no such color as pure black we had a color mixed which we term black and which is called black in this system."*

The Munsell hue of each sample is also indicated in the figure. The reason for this behavior is seen in the spectral reflectance curves of Fig. 3, which show large differences at both ends of the spectrum.

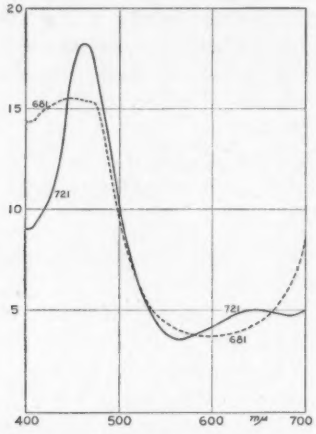

FIG. 3. *Spectral reflectance of the leading colors in the series shown in Fig. 2.*

The method of plotting used in Fig. 2 discloses great differences of behavior when different colors are mixed with white. In Fig. 4*a* the entire block 721–768 is set out, and it will be seen that the addition of white at first increases the chroma, with little effect on value, the curves exhibiting a maximum. The yellow-greens 1105–1152, on the other hand (see Fig. 4*b*), are reduced in chroma by any addition of white, except where they have been largely mixed with black (1137–1144, 1145–1152). Figs. 4*c* and 4*d* show blocks intermediate in behavior and a rather irregular block is shown in Fig. 4*e*.

The addition of white naturally leads to progressive hue changes. In Fig. 5 the hues of the leading series in each block are plotted for each Plochere value level. There is some regularity in the behavior of the hues as white is added, the series in the neighborhood of 8Y and 2.5RP tending to converge to these hues, while other series diverge from 8PB, 6R, and (less definitely) 2.5G. It may be no more than a coincidence that 8Y and 8PB, also 2.5RP and 2.5G, are complementary pairs, especially since nothing appears at the complementary of 6R. It will also be noted that levels d and e provide a fairly uniform range of hues in the leading series of the blocks.

The fourth series of each block has been similarly plotted in Fig. 6. The points of divergence and convergence persist, though less marked, the one in the vicinity of 2.5RP and 2.5G being rather diffuse. At this chroma level the series beginning with 649 and 697 differ by little more than the probable error of matching.

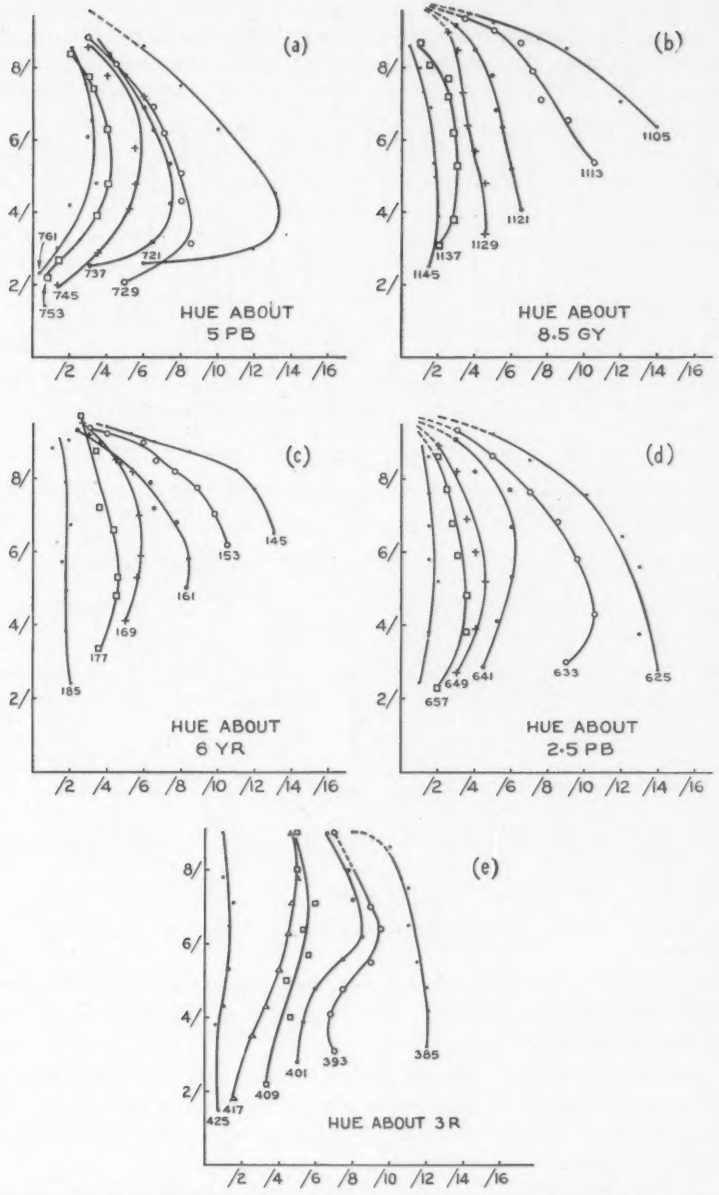

FIG. 4. *Value and chroma. (a) A block of colors in which the addition of white at first raises chroma markedly; (b) one in which it lowers chroma except in the series of lowest saturation; (c) and (d) blocks intermediate in behavior; (e) one with irregular changes in chroma.*

Evaluation of the Plochere System

In general the Plochere system seems very suitable for its purpose. Nearly all the samples have very uniform matte surfaces, only one being noted as significantly nonuniform over its area. Some colors of low value show slight

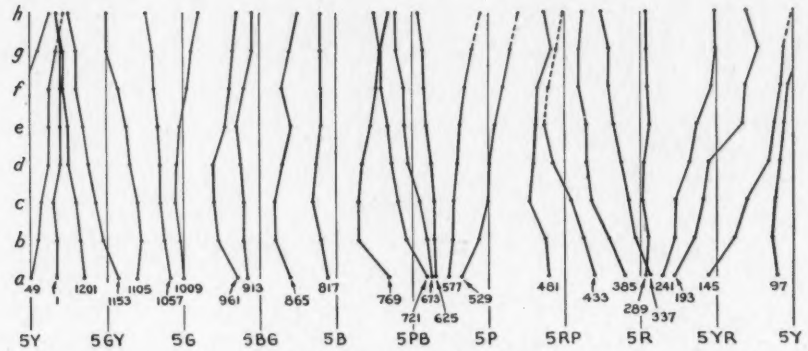

FIG. 5. *Hue changes with addition of white for the leading series of the 2ō blocks. The ordinates are the Plochere value levels.*

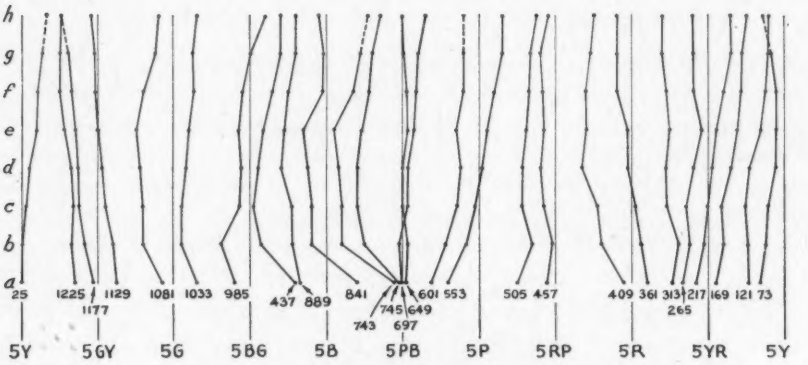

FIG. 6. *Hue changes with addition of white for the fourth series of each block.*

bronzing, others are slightly glossy; but these defects are common to other systems using painted samples. The large size of the cards is a distinct advantage to the user.

Some of the blocks are probably slightly fluorescent. This may be inevitable in a system which covers so wide a range of chroma and value. None, however, seem to fluoresce notably in the near ultraviolet from a standard "black light" lamp.

Many of the light tints are very difficult to distinguish from others of similar value in the same region of hue, and at first sight the system might be criticized as being redundant. Such criticism would have to ignore the stated purpose

of the system, which is to show the colors obtained by mixing certain chromatic pigments with black and white in stated proportions. The "rectangular" arrangement is probably the best for this purpose, though not necessary for the study of color harmony.

A more valid criticism concerns the irregularity in hue, especially the large hiatus in the purple, which might well be filled in future editions. Not very much harm would be done by omitting the present Bg block (673-720), and a new one beginning near 2.5P might well replace it. On the other side of the hue circle, the blocks 1201–1248, 1–48, 49–96, and 97–144 might well be modified to keep them more constant in hue.

These are minor defects, and detract only a little from the general usefulness of the Plochere System in the field for which it is designed. It may further be suggested that colorimetrists and other color workers will find the Plochere cards a useful source of well made chromatic surfaces for any purpose where standardized samples are not needed.

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